

REMARKS

INTRODUCTION:

In accordance with the foregoing, claims 2 and 3 have been amended; and claims 9-14 have been added. Support for the amendments and the new claims can be found in the Specification, for example page 8, lines 19-22, and from page 7, line 9, to page 8, line 2. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-3, 5-7, and 9-14 are pending and under consideration.

CHANGES TO THE SPECIFICATION:

The specification has been reviewed in response to this Office Action. Changes have been made to the specification only to place it in preferred and better U.S. form for issuance. No new matter has been added.

REJECTION UNDER 35 U.S.C. §103:

In the Office Action, at page 2, item 3, the Examiner rejected claims 1-3 and 5-7 under 35 U.S.C. §103(a) as being unpatentable over Suzuki et al. (4,877,717 - hereinafter Suzuki). The reasons for the rejection are set forth in the Office Action and therefore not repeated. Applicants traverse this rejection and respectfully request reconsideration.

Independent claim 1 recites "...said resin layer is in a thickness of 300 μm or smaller at least at a part of a region within 1 mm from the peripheral edge face of the resin layer; and said resin layer is in a thickness of 850 μm or larger at a position which is thickest in said resin layer."

And amended independent claim 2 recites "...said resin layer is in a thickness of 300 μm or smaller at least at a part of a region outside an effective-diameter region; and said resin layer is in a thickness of 850 μm or larger at a position which is thickest in that layer."

The subject application states that previously, resin layer thicknesses 850 μm or larger were not possible because the base member would break when the resin cured on the base member was released from a mold. (See page 2, line 22 to page 3, line 2.)

Suzuki discloses that "...microlenses are finally obtained when a surface tension and similar forces act on the exposed film." (Suzuki col. 4, lines 32-34) Suzuki also discloses that the "...formation of a spherical surface of the film in the exposed area is caused in particular by the lowering of the freezing point and freezing speed and by the surface tension." (Suzuki col. 12, lines 63-66).

Additionally, Suzuki discloses that the thickness and diameter of the microlenses are determined by migration of unreacted photoreactive compounds (monomers) from unexposed areas into the exposed layers of the film. (See Suzuki col. 4, lines 29-32 and col. 11, lines 23-32). Thus the thickness and diameter of the microlenses are limited by, among other factors, the surface tension.

Further, Suzuki discloses that proper microlens formation is temperature dependent, with the preferred exposure temperature being about 40°C. Also, a "...lower temperature than the above will not allow a permeation of the monomers from the unexposed area to the exposed area, and at a temperature higher than the above lenses with an unacceptably large diameter will be formed." (Suzuki col. 12, line 66 to col. 13, line 3). Thus, there are size limits to microlenses that are successfully formed by the methods disclosed in Suzuki.

FIGS. 9-11 in Suzuki show microlenses resulting from experiments having diameters ranging from about 20 - 500µm, and thicknesses ranging from about 0.23 – 3.73µm. Further, FIG. 4 shows a microlens "...having a diameter of 100µm.." and a maximum thickness of 10µm. (Suzuki col. 9, lines 45-51 – emphasis added)

The successfully formed microlenses disclosed in Suzuki are limited to be significantly smaller than the resin-cemented optical elements of the subject application. Thus, Suzuki neither discloses, nor suggests a resin layer having a thickness that is "...850 µm or larger at a position which is thickest in said resin layer."

Applicants respectfully submit that independent claims 1 and 2 patentably distinguish over the cited art, and should be allowable for at least the above-mentioned reasons. Further, Applicants respectfully submit that claims 3, and 5-7, which ultimately depend from either claim 1 or claim 2, should be allowable for at least the same reasons as claims 1 and 2, as well as for the additional features recited therein.

NEW CLAIMS

Applicants respectfully submit that claims 9-12, which depend from either claim 1 or claim 2, should be allowable for at least the same reasons as claims 1 and 2, as well as for the additional features recited therein.

Independent claim 13 recites a resin layer having "...a thickness of 300 µm or smaller at least at a part of a region within 1 mm from a peripheral edge face of the resin layer, and a maximum thickness of at least 850 µm."

And independent claim 14 recites a resin layer having "...a diameter of at least 34 mm, a thickness of 300 μ m or smaller at least at a part of a region within 1 mm from a peripheral edge face of the resin layer, and a maximum thickness of at least 850 μ m.

For the reasons stated in the section regarding the rejection under 35 U.S.C. §103, Applicants respectfully submit that independent claims 13 and 14 patentably distinguish over the cited art, and should be allowable.

CONCLUSION:

In accordance with the foregoing, Applicants respectfully submit that all outstanding objections and rejections have been overcome and/or rendered moot, and further, that all pending claims patentably distinguish over the cited art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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